Table 3.X. Conservation Measure Effectiveness Monitoring and Potential Adaptive Management Responses

Note: this draft table would be presented in Section 3.5, Monitoring Plan, of Chapter 3, Conservation Strategy.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
WOCM1a: Construct a new water diversion facility in the north Delta with multiple intakes and fish screens and an isolated canal facility.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
WOCM1b: Preferentially operate a new water diversion facility in the north Delta while maintaining sufficient bypass flows for covered fish species.	**Effectiveness:** Maintain suitable water velocities to transport larval and juvenile lifestages of splittail, delta and longfin smelt, and juvenile Chinook salmon and steelhead downstream	Distance of transport/day of planktonic fish eggs and larvae between Hood and Cache Sloug	Maintain river flows so that __% of planktonic fish eggs and larval fish are transported from Hood to Emmaton within __ days.	Initial years following operation of North Delta Diversion Facilities until a relationship between planktonic transport and diversion bypass flows is established. Surveys to confirm relationships are maintained over time conducted every fifth year thereafter.	Predict transport rate of planktonic particles using drifters released at various tides and flows at Hood and Emmaton on the lower Sacramento River; sample larval delta smelt and other fish at various locations within the Sacramento River to assess their health and condition as a function of downstream transport rate and location.	Establish a relationship between planktonic transport and north Delta bypass flows.	Consider adjusting bypass flows or other water controls to improve transport.
WOCM2a: Modify the Fremont Weir and the Yolo Bypass to provide for a higher frequency and duration of inundation.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
WOCM2b: Operate the Fremont Weir and the Yolo Bypass to provide for a higher frequency and duration of inundation.	**Effectiveness:** Increase production of organic carbon in support of food production within the Delta	mg/L total organic carbon	Increase total organic carbon concentrations in Yolo Bypass outflows relative to concentrations in inflows by at least __ percent during periods the modified Fremont Weir is operated.	Initial years in which modified Fremont Weir is operated until a relationship between total organic carbon and inundation is established and at every fifth year of modified Fremont Weir operation thereafter.	Daily grab sample measurements of total organic carbon in the inflow to the weir and outflow to Cache Slough over the term of inundation.	Establish a relationship between bypass inflows and total organic carbon concentrations during periods the modified Fremont Weir is operated under conditions with and without concurrent flood flows to the bypass from Westside tributaries.	Adjust timing, flow volume, and/or duration of floodplain inundation Conduct investigations, if warranted, to determine other causes for not achieving target.
	Effectiveness: Increase production of phytoplankton as a food source within the floodplain and Delta	mg/L chlorophyll a	Increase chlorophyll a concentrations in Yolo Bypass outflows relative to concentrations in inflows by at least __ percent during periods the modified Fremont Weir is operated.	Initial years in which modified Fremont Weir is operated until a relationship between primary production and inundation is established and at every fifth year of modified Fremont Weir operation thereafter.	Daily grab sample measurements of chlorophyll a in the inflow to the weir and outflow to Cache Slough over the term of inundation.	Establish a relationship between bypass inflows and chlorophyll a concentrations and total organic carbon concentrations during periods the modified Fremont Weir is operated under conditions with and without concurrent flood flows to the bypass from Westside tributaries.	Adjust timing, flow volume, and/or duration of floodplain inundation Conduct investigations, if warranted, to determine other causes for not achieving target.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
	Effectiveness: Increase production of zooplankton as a food source within the floodplain and Delta	Number of zooplankton/1000 m^3	Increase zooplankton densities in Yolo Bypass outflows relative to densities in inflows by at least __ percent during periods the modified Fremont Weir is operated.	Initial years in which modified Fremont Weir is operated until a relationship between zooplankton densities and inundation is established and at every fifth year of modified Fremont Weir operation thereafter.	Daily grab sample (500 um mesh net) measurements of zooplankton in the inflow to the weir and outflow to Cache Sloug over the term of inundation.	Establish a relationship between bypass inflows and zooplankton densities and chlorophyll A concentrations during periods the modified Fremont Weir is operated under conditions with and without concurrent flood flows to the bypass from Westside tributaries.	Adjust timing, flow volume, and/or duration of floodplain inundation Conduct investigations, if warranted, to determine other causes for not achieving target.
	Effectiveness: Increase the production of splittail	Number of larval and early juvenile splittail /1,000 m^3	Increase the density of larval and early juvenile splittail densities in Yolo Bypass outflows relative to densities in inflows by at least __ percent during periods the modified Fremont Weir is operated.	Initial years in which modified Fremont Weir is operated until a relationship between larval and early juvenile splittail densities and inundation is established and at every fifth year of modified Fremont Weir operation thereafter.	Daily grab sample (500 um mesh net) measurements of fish eggs and larvae (icthyoplankton) in the inflow to the weir and outflow to Cache Slough. Samples would be processed to identify and enumerate the density of each larval fish species.	Establish a relationship between bypass inflows and larval and early juvenile splittail densities during periods the modified Fremont Weir is operated under conditions with and without concurrent flood flows to the bypass from Westside tributaries.	Adjust timing, flow volume, and/or duration of floodplain inundation Conduct investigations, if warranted, to determine other causes for not achieving target.
	Effectiveness: Increase the net survival of juvenile Chinook salmon and steelhead	Percent juvenile Chinook salmon and steelhead survival	Increased survival of __ percent or more for juveniles migrating through the bypass compared to the survival of fish in the mainstem river	Initial years in which modified Fremont Weir is operated until a relationship with juvenile Chinook salmon and steelhead survival rates is established and at every fifth year of modified Fremont Weir operation thereafter.	Comparative mark-recapture experiments (e.g., CWT, acoustic, radio, PIT tags) using juvenile salmon and steelhead released into the bypass and in the mainstem Sacramento River downstream of the bypass and sampled at Rio Vista to determine the difference in survival rates between the migration routes.	Establish a relationship between operation of a modified Fremont Weir and juvenile Chinook salmon and steelhead survival.	Adjust timing, flow volume, and/or duration of floodplain inundation Conduct investigations, if warranted, to determine other causes for not achieving target.
	Effectiveness: Increase the net growth rate and size of juvenile Chinook salmon and steelhead	mm/day juvenile Chinook salmon and steelhead growth	Increased growth rate of __ percent or more for juveniles migrating through the bypass compared to growth of fish in the mainstem river	Initial years in which modified Fremont Weir is operated until a relationship with juvenile Chinook salmon and steelhead growth rates are established and at every fifth year of modified Fremont Weir operation thereafter.	Comparative mark-recapture experiments (e.g., PIT tags) using juvenile salmon and steelhead released into the bypass and in the mainstem Sacramento River downstream of the bypass and sampled at Rio Vista to determine relative difference in juvenile growth rates between the migration routes.	Establish a relationship between operation of a modified Fremont Weir and juvenile Chinook salmon and steelhead growth rates.	Adjust timing, flow volume, and/or duration of floodplain inundation Conduct investigations, if warranted, to determine other causes for not achieving target.
WOCM3a: Create a new flood bypass in the Yolo Bypass/Cache Slough Complex ROA to restore seasonally inundated floodplain habitat.	To come.	To come.	To come.	To come.	To come.	To come.	To come.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
WOCM3b: Operate a new flood bypass in the Yolo Bypass/Cache Slough Complex ROA to restore seasonally inundated floodplain habitat.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
WOCM4: Maintain sufficient flows in Sutter and Steamboat Sloughs for environmental benefits.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
WOCM5: Operate the Delta Cross Channel Gate for environmental benefits.	**Effectiveness:** Increase the net survival of juvenile Chinook salmon and steelhead	Percent juvenile salmon and steelhead survival	Increased survival of __% or more for those juvenile salmonids downstream within the Sacramento River when compared to current baseline conditions	Late-winter and early spring juvenile salmonid migration period (January –May)	Mark-recapture experiments (e.g., CWT, acoustic, radio, PIT tags) using juvenile salmon and steelhead migrating downstream through the Sacramento River.		Adjust Delta Cross Channel gate operations to reduce movement of juvenile salmonids into the central Delta or modify operations of other water controls to improve survival.
WOCM6: Rio Vista Flow Requirements.	**Effectiveness:** Maintain suitable water velocities to transport larval and juvenile lifestages of splittail, delta and longfin smelt, and juvenile Chinook salmon and steelhead downstream	Distance of transport/day of planktonic fish eggs and larvae between Cache Slough and Emmaton	Maintain river flows so that __% of planktonic fish eggs and larval fish are transported from Cache Slough to Emmaton within __ days.	Initial years following operation of North Delta Diversion Facilities until a relationship between planktonic transport and diversion bypass flows is established. Surveys to confirm relationships are maintained over time conducted every fifth year thereafter.	Predict transport rate of planktonic particles using drifters released at various tides and flows at the confluence between Cache Slough and the Sacramento River and Emmaton on the lower Sacramento River; sample larval delta smelt and other fish at various locations within the Sacramento River to assess their health and condition as a function of downstream transport rate and location.	Establish a relationship between planktonic transport and Rio Vista flows.	Consider adjusting bypass flows or other water controls to improve transport.
	Effectiveness: Provide suitable attraction flows in the lower Sacramento River to attract upstream migrating adult Chinook salmon and steelhead and reduce delays in migration and straying to other watersheds	Percent change in migration delays Percent change in incidence of straying	Reduce delays in upstream migration of adult Chinook salmon entering the Sacramento River and reduce the frequency of straying relative to existing conditions	September to May. Initial years following operation of North Delta Diversion Facilities until a relationship between upstream migration success and Rio Vista flows are established. Surveys to confirm relationships are maintained over time conducted every fifth year thereafter.	Conduct experimental studies using acoustic or radio tagging technology to monitor the behavioral response and migration of adult salmon in response to Sacramento River flow during the migration period; estimate the percentage of adult Chinook salmon straying to other watersheds as a function of river flows using acoustic, radio tagging, or alternative method	Establish a relationship between successful upstream migration and Rio Vista flows	Consider adjusting bypass flows or other water controls to improve transport.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
WOCM7: Three Mile Slough Gate Operations	**Effectiveness:** Increase the survival of juvenile Chinook salmon and steelhead	Percent juvenile salmon and steelhead survival	Increased survival of __ % or more for those juvenile salmonids migrating through the lower Sacramento River compared to conditions when the gates are open	Late-winter and early spring juvenile salmonid migration period (January –May) Near-term implementation and initial years following operation of North Delta Diversion Facilities until a relationship between percent survival and gate operations is established. Surveys to confirm relationships are maintained over time conducted every fifth year thereafter.	Comparative mark-recapture experiments (e.g., CWT, acoustic, radio, PIT tags) using juvenile salmon and steelhead migrating downstream through the Sacramento River when the Three Mile Slough gates are open and under strategic tidal gate operations.	Establish relationship between gate operations juvenile survival	Adjust gate operations or other water controls related to effects of gate operations to improve survival.
WOCM8: Install and operate gates at Old River and Connection Sloughs ("Two Gates") to reduce the entry of saline water and covered species into the interior Delta.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
WOCM9: Maintain sufficient Delta outflows for environmental benefits.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
WOCM10: Maintain sufficient Suisun Bay and Western Delta salinity conditions for environmental benefits.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
WOCM11: Operate the Montezuma Slough Salinity Control Gate for environmental benefits.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
WOCM12: Operate the South Delta diversions for environmental benefits.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
WOCM13: Old and Middle River Flows	**Effectiveness:** Reduce the incidental take of adult and juvenile delta smelt resulting from fish salvage SWP and CVP export facilities	Number of delta smelt salvaged at SWP and CVP salvage facilities	Reduce incidental take of delta smelt by __% compared to current take limits	In accordance with existing monitoring protocol schedule	Routine daily fish salvage monitoring in accordance with existing protocols		Adjust south Delta export operations or other water controls related to Old and Middle River flows.
WOCM14: Maintain sufficient Delta Salinity Standards for human benefits.	To come.	To come.	To come.	To come.	To come.	To come.	To come.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
HACM1: Restore floodplain habitat along __ miles of the San Joaquin River from Vernalis to Mossdale	**Effectiveness:** Increase the survival of juvenile Chinook salmon and steelhead	Percent juvenile salmon and steelhead survival	Increased survival of __ percent or more for those juvenile salmonids near Mossdale relative to existing conditions	February-May Collect baseline survival information before implementing restoration (or before restored habitat is functional). Monitor survival following restoration of functional habitat until a relationship is established be restored habitat and juvenile survival.	Mark-recapture experiments (e.g., CWT, acoustic, radio, PIT tags) using juvenile salmon and steelhead migrating downstream from Vernalis to Mossdale.	Changes in survival relative to periods of floodplain inundation and improvements in channel habitat conditions.	If target is not met, conduct investigations to determine cause. If cause is related to floodplain and channel improvement designs, adjust channel habitat conditions and adjust design of future floodplain/channel restorations.
	Effectiveness: Increase production of organic carbon in support of food production within the Delta	mg/L total organic carbon	Increase mean annual total organic carbon concentrations entering the Delta from restored reaches of the San Joaquin River relative to concentrations in the channels before habitat is restored by at least __ percent within __ years of restoration.	Initial years in which habitat is restored until a relationship between total organic carbon and restored habitat is established and at every 5 year intervals thereafter.	Weekly grab sample measurements of total organic carbon within restored reaches.	Establish a relationship between restored habitat conditions and total organic carbon production.	If target is not met, conduct investigations to determine cause. If cause is related to floodplain and channel improvement designs, adjust channel habitat conditions and adjust design of future floodplain/channel restorations.
	Effectiveness: Increase production of phytoplankton as a food source within the Delta	mg/L chlorophyll a	Increase mean annual total chlorophyll a concentrations entering the Delta from restored reaches of the San Joaquin River relative to concentrations in the channels before habitat is restored by at least __ percent within __ years of restoration.	Initial years in which habitat is restored until a relationship between total chlorophyll a and restored habitat is established and at every 5 year intervals thereafter.	Weekly grab sample measurements of chlorophyll a within restored reaches.	Establish a relationship between restored habitat conditions and total chlorophyll a.	If target is not met, conduct investigations to determine cause. If cause is related to floodplain and channel improvement designs, adjust channel habitat conditions and adjust design of future floodplain/channel restorations.
	Effectiveness: Increase production of zooplankton as a food source within the Delta	Number of zooplankton/1000 m^3	Increase mean annual total zooplankton densities entering the Delta from restored reaches of the San Joaquin River relative to concentrations in the channels before habitat is restored by at least __ percent within __ years of restoration.	Initial years in which habitat is restored until a relationship between zooplankton densities and restored habitat is established and at every 5 year intervals thereafter.	Daily grab sample (500 um mesh net) measurements of zooplankton within waterways adjacent to restored reaches.	Establish a relationship between restored habitat conditions and zooplankton densities and chlorophyll A concentrations.	If target is not met, conduct investigations to determine cause. If cause is related to floodplain and channel improvement designs, adjust channel habitat conditions and adjust design of future floodplain/channel restorations.
	Effectiveness: Increase the production of splittail	Number of larval and early juvenile splittail /1,000 m^3	Increase the density of larval and early juvenile splittail densities in San Joaquin River at Stockton relative to densities in inflows at Vernalis by at least __ percent during floodplain inundation periods.	Initial years of floodplain inundation following floodplain restoration until a relationship between larval and early juvenile splittail densities and inundation is established and at every fifth inundation year thereafter.	Daily grab sample (500 um mesh net) measurements of fish eggs and larvae (icthyoplankton) from the river at Vernalis and Stockton during the late winter and early spring. Samples would be processed to identify and enumerate the density of each larval fish species.	Establish a relationship between floodplain inundation and larval and early juvenile splittail densities during periods.	If target is not met, conduct investigations to determine cause. If cause is related to floodplain and channel improvement designs, adjust channel habitat conditions and adjust design of future floodplain/channel restorations.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
HRCM2: Restore floodplain habitat along __ miles of the San Joaquin River from Mossdale to French Camp Slough.	To come.	To come.	To come.	To come.	To come.	To come.	To come.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
HRCM3: Restore between __ and __ acres of inundated floodplain habitat in the South Delta Restoration Opportunity Area.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
HACM4-8 (Restoration of freshwater tidal marsh in various ROAs)	**Effectiveness:** Increase production of organic carbon in support of food production within the Delta	mg/L total organic carbon	Increase mean annual total organic carbon concentrations entering Delta waterways adjacent to restored tidal marsh relative to concentrations in the channels before marsh is restored by at least __ percent within __ years of restoration.	Initial years in which tidal marshes are restored until a relationship between total organic carbon and restored marsh is established and at every 5 year intervals thereafter.	Weekly grab sample measurements of total organic carbon within each restored tidal marsh habitat.	Establish a relationship between restored tidal marsh conditions and total organic carbon production.	Conduct investigations to determine cause for not achieving target. If cause is related to tidal marsh design, adjust restoration designs and management to improve function (e.g., improve marsh plain vegetation cover, adjust tidal hydrodynamics, control non-natives).
HACM4-8 (Restoration of freshwater tidal marsh in various ROAs)	**Effectiveness:** Increase production of phytoplankton as a food source within the Delta	mg/L chlorophyll a	Increase mean annual chlorophyll a concentrations in Delta waterways adjacent to restored tidal marsh relative to concentrations in the channels before marsh is restored by at least __ percent within __ years of restoration.	Initial years in which tidal marshes are restored until a relationship between chlorophyll a concentrations and restored marsh is established and at every 5 year intervals thereafter.	Weekly grab sample measurements of chlorophyll a concentrations within waterways adjacent to each restored tidal marsh habitat.	Establish a relationship between restored tidal marsh conditions and chlorophyll a concentrations and total organic carbon concentrations.	Conduct investigations to determine cause for not achieving target. If cause is related to tidal marsh design, adjust restoration designs and management to improve function (e.g., improve marsh plain vegetation cover, adjust tidal hydrodynamics, control non-natives).
HACM4-8 (Restoration of freshwater tidal marsh in various ROAs)	**Effectiveness:** Increase production of zooplankton as a food source within the Delta	Number of zooplankton/1000 m^3	Increase mean annual zooplankton densities in Delta waterways adjacent to restored tidal marsh relative to densities in the channels before marsh is restored by at least __ percent within __ years of restoration.	Initial years in which tidal marshes are restored until a relationship between zooplankton densities and restored marsh is established and at every 5 year intervals thereafter.	Daily grab sample (500 um mesh net) measurements of zooplankton within waterways adjacent to each restored tidal marsh habitat.	Establish a relationship between restored tidal marsh conditions and zooplankton densities and chlorophyll A concentrations.	Conduct investigations to determine cause for not achieving target. If cause is related to tidal marsh design, adjust restoration designs and management to improve function (e.g., improve marsh plain vegetation cover, adjust tidal hydrodynamics, control non-natives).
HACM4-8 (Restoration of freshwater tidal marsh in various ROAs)	**Effectiveness:** Provide increased habitat availability for all covered fish species	Number of each covered fish species /10,000m^3	Increase the abundance of each covered fish species inhabiting restored tidal marsh by __% relative to existing conditions	Monthly Initial years following restoration of functioning habitat until relationships between abundance of the covered fish species and restored habitat is established. Periodic subsequent monitoring at intervals of no more than 5 years.	Fishery sampling within restored marsh channels and in adjacent Delta waterways using a combination of survey methods consistent with the current Suisun Marsh fishery survey program with additional survey methods as needed (e.g., beach seine, otter trawl, tow net, ichthyoplankton net).	Establish a relationship between abundance of covered fish species and extent and function of restored tidal marsh habitats.	Conduct investigations to determine cause for not achieving target. If cause is related to tidal marsh design, adjust restoration designs and management to improve function (e.g., improve marsh plain vegetation cover, adjust tidal hydrodynamics, control non-natives).

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
HACM9: Restore a mosaic of __ to __ acres of brackish intertidal marsh, shallow subtidal aquatic, and transitional grassland habitat within the Suisun Marsh Restoration Opportunity Area.	**Effectiveness:** Increase production of organic carbon in support of food production within Montezuma Slough and Suisun Bay	mg/L total organic carbon	Increase mean annual total organic carbon concentrations entering Delta waterways adjacent to restored tidal marsh relative to concentrations in the channels before marsh is restored by at least __ percent within __ years of restoration.	Initial years in which tidal marshes are restored until a relationship between total organic carbon and restored marsh is established and at every 5 year intervals thereafter.	Weekly grab sample measurements of total organic carbon within each restored tidal marsh habitat.	Establish a relationship between restored tidal marsh conditions and total organic carbon production.	Conduct investigations to determine cause for not achieving target. If cause is related to tidal marsh design, adjust restoration designs and management to improve function (e.g., improve marsh plain vegetation cover, adjust tidal hydrodynamics, control non-natives).
	Effectiveness: Increase production of phytoplankton as a food source within Montezuma Slough and Suisun Bay	mg/L chlorophyll a	Increase mean annual chlorophyll a concentrations in Delta waterways adjacent to restored tidal marsh relative to concentrations in the channels before marsh is restored by at least __ percent within __ years of restoration.	Initial years in which tidal marshes are restored until a relationship between chlorophyll a concentrations and restored marsh is established and at every 5 year intervals thereafter.	Weekly grab sample measurements of chlorophyll a concentrations within waterways adjacent to each restored tidal marsh habitat.	Establish a relationship between restored tidal marsh conditions and chlorophyll a concentrations and total organic carbon concentrations.	Conduct investigations to determine cause for not achieving target. If cause is related to tidal marsh design, adjust restoration designs and management to improve function (e.g., improve marsh plain vegetation cover, adjust tidal hydrodynamics, control non-natives).
	Effectiveness: Increase production of zooplankton as a food source within Montezuma Slough and Suisun Bay	Number of zooplankton/1000 m^3	Increase mean annual zooplankton densities in Delta waterways adjacent to restored tidal marsh relative to densities in the channels before marsh is restored by at least __ percent within __ years of restoration.	Initial years in which tidal marshes are restored until a relationship between zooplankton densities and restored marsh is established and at every 5 year intervals thereafter.	Daily grab sample (500 um mesh net) measurements of zooplankton within waterways adjacent to each restored tidal marsh habitat.	Establish a relationship between restored tidal marsh conditions and zooplankton densities and chlorophyll A concentrations.	Conduct investigations to determine cause for not achieving target. If cause is related to tidal marsh design, adjust restoration designs and management to improve function (e.g., improve marsh plain vegetation cover, adjust tidal hydrodynamics, control non-natives).
	Effectiveness: Provide increased habitat availability for all covered fish species	Number of each covered fish species /10,000m^3	Increase the abundance of each covered fish species inhabiting Suisun Marsh by __% relative to existing conditions	Monthly Initial years following restoration of functioning habitat until relationships between abundance of the covered fish species and restored habitat is established. Periodic subsequent monitoring at intervals of no more than 5 years.	Fishery sampling at Suisun Marsh fishery survey locations and up to five additional locations within the inundated aquatic habitat using a combination of survey methods consistent with the current Suisun Marsh fishery survey program with additional survey methods as needed (e.g., beach seine, otter trawl, tow net, ichthyoplankton net).	Establish a relationship between abundance of covered fish species and extent and function of restored tidal marsh habitats.	Conduct investigations to determine cause for not achieving target. If cause is related to tidal marsh design, adjust restoration designs and management to improve function (e.g., improve marsh plain vegetation cover, adjust tidal hydrodynamics, control non-natives).
HRCM10: Support development and implementation of levee construction and maintenance designs that incorporate aquatic, intertidal marsh, and riparian habitat features.	To come.	To come.	To come.	To come.	To come.	To come.	To come.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
HRCM11: Provide for the establishment of native riparian woody vegetation and emergent vegetation on BDCP constructed levees.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
HRCM12: Enhance channel margin habitats along __ to __ miles of Steamboat and Sutter Sloughs to improve habitat conditions for covered fish species.	**Effectiveness:** Increase the net survival of juvenile Chinook salmon and steelhead	Percent survival juvenile salmon and steelhead survival	Increased survival of __ percent or more for juveniles migrating through Steamboat and Sutter Sloughs compared to the survival of fish in the mainstem river	Initial years following modifications of sloughs until a relationship with juvenile Chinook salmon and steelhead survival rates is established and at every fifth year thereafter.	Comparative mark-recapture experiments (e.g., CWT, acoustic, radio, PIT tags) using juvenile salmon and steelhead released into Steamboat and Sutter Sloughs and in the mainstem Sacramento River downstream of the slough and sampled at Rio Vista to determine the difference in survival rates between the migration routes.	Establish a relationship between access and habitat improvements with juvenile Chinook salmon and steelhead survival.	If target is not met, consider modifying the action to better habitat restoration to improve survival. If target is met or exceeded, consider installing structures in the Sacramento River to guide a greater proportion of juvenile fish into the sloughs.
HRCM13: Enhance channel margin habitats along __ to __ miles of the San Joaquin River in the San Joaquin River ROA to improve habitat conditions for covered fish species.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
HRCM14: Restore between __ and __ acres of riparian forest and scrub communities as a component of restored floodplain, freshwater intertidal marsh, and channel margin habitats.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM1: Reduce the Load of Ammonia in Effluent Discharged from the Sacramento Regional County Sanitation District into the Sacramento River if Warranted Based on Research.	**Performance:** Reduce concentrations of ammonia in sewage treated from an enhanced ammonia reduction technique	Percent reduction in ammonia concentration before and after enhanced treatment	Reduce ammonia concentrations by __ percent or more	Year long	Standard water chemistry testing for ammonia concentration on water sampled at influent and effluent	Establish that the enhanced ammonia reduction technique is effective at reducing ammonia concentrations	If target is not met, the enhanced reduction technique would be re-evaluated.
OSCM2: Reduce the Load of Endocrine Disrupting Compounds in Effluent Discharged from Wastewater Treatment Plants into Delta Waterways if Warranted Based on Research..	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM3: Reduce the Load of Methylmercury Entering Delta Waterways.	To come.	To come.	To come.	To come.	To come.	To come.	To come.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
OSCM4: Reduce the Load of Pesticides and Herbicides Entering Delta Waterways from In-Delta Sources that are Believed to be Toxic to Covered Fish Species.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM5: Reduce the Loads of Toxic Contaminants in Stormwater Pollution and Urban Runoff by Working with Existing Efforts in the Delta.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM6: Provide for Rapid Detection of and Response to Toxic Contaminant Events that could Affect Covered Fish Species.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM7: Maintain Dissolved Oxygen Levels for Covered Fish Species in the Stockton Deep Water Ship Channel during Periods when Covered Fish Species are Present.	**Effectiveness:** Reduce dissolved oxygen concentrations within the Stockton Deep Water Ship Channel to objectives set by the CVRWQCB: Sep-Nov: 6.0 mg/L Dec-Aug: 5.0 mg/L	Migration rate of tagged adult steelhead and Chinook salmon (miles/day)	Migration rate is not impaired relative to nearby locations by more than __ percent.	Sep 1 – Nov 30	Tag adult steelhead and Chinook salmon with acoustic tags and monitor migration rates	Establish effects of low dissolved oxygen concentraions on migration rates of adult steelhead and salmon	Dissolved oxygen enhacement technique would be re-evaluated and improved or replaced
	Performance: Intertidal marsh habitat restoration in the San Joaquin River nearby and upstream of the Stockton Deep Water Ship Channel	Mg/L of dissolved oxygen	Maintain CVRWQCB objectives for dissolved oxygen concentrations	Year long	Real-time monitoring stations would measure dissolved oxygen concentrations every mile through the SDWSC, as is done currently at Rough and Ready Island.	Establish relationship of tidal marsh restoration and dissolved oxygen concentrations in the SDWSC	If target is not met, develop additional techniques for improving dissolved oxygen concentrations in SDWSC with the Port of Stockton, USACE, and CVRWQCB
OSCM8: Improve the Quality of Water Discharged from Managed Seasonal Wetlands into Suisun Bay and Delta Waterways to Prevent Dissolved Oxygen Sags.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM9: Reduce the Risk for Future Introductions of Non-Native Aquatic Organisms from Commercial Vessels.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM10: Reduce the Risk for Future Introductions of Non-Native Aquatic Organisms from Recreational Watercraft.	To come.	To come.	To come.	To come.	To come.	To come.	To come.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
OSCM11: Provide for Rapid Detection of and Response to New Introductions of Non-Native Species into Delta Waterways.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM12: Reduce the Risk for Establishment of Zebra Mussel and Quagga Mussel in Delta Waterways.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM13: Remove non-native submerged and floating aquatic vegetation from delta waterways	**Performance:** Removal of Egeria densa	Change in biovolume of *Egeria densa* relative to control areas	Reduce the biovolume of Egeria by __% on average after 90 days of treatment in treated areas relative to control areas. No year-over-year increase in pre-treatment biovolume in a treatment site relative to nearby control site.	90 days after treatment Annually in April	Field surveys would be conducted using hydroacoustic analysis, as has been previously conducted, in treatment locations to estimate the biovolume of plants.	Establish a relationship between treatment methods and control success	Investigate and implement more effective control methods or intensify control treatments.
	Performance: Removal of water hyacinth	Change in areal cover of water hyacinth relative to control areas	Reduce the areal cover of water hyacinth by __% on average after 90 days of treatment in treatment/ removal areas relative to control areas. No year-over-year increase in pre-treatment areal cover in a treatment site relative to nearby control site.	90 days after treatment/ removal Annually in April	Field surveys would be conducted using remote sensing areal cover estimates	Establish a relationship between treatment methods and control success	
	Effectiveness: Removal of non-native submerged and floating aquatic vegetation	Change in turbidity measured as Nephelometric Turbidity Units (NTUs)	Increase mean annual turbidity in waterways treated by __% relative to adjacent control locations	Monthly following treatment in waterways until a strong relationship between extent of SAV removal and change in turbidity is established.	Turbidity measurements within treated waterways and in nearby control locations with similar pre-treatment conditions (e.g., hydrodynamic, SAV density) where SAV has not been removed.	Establish a relationship between extent of SAV removal and change in turbidity.	If there is no relationship between removal and turbidity, consider discontinuing action if there are no positive responses to control efforts by covered fish species.
	Effectiveness: Removal of non-native submerged and floating aquatic vegetation	Localized density of splittail and salmonids (fish/m^3).	Increase localized abundance of juvenile splittail and salmonids by ___% from 1 week prior before to 90 days after treatment/removal relative to a nearby control location.	1 week before treatment/ removal to 90 days after treatment/removal	Catch fish using electrofishing, pop nets, or other unbiased sampling technique for collecting fish in vegetation 1 week prior to and 90 days after removal of Egeria in areas both within and nearby removal locations	Establish a relationship between local density of juvenile splittail and salmonids and SAV/FAV density	If there is no relationship between removal and localized density of juvenile splittail and salmonids, consider discontinuing action if there are no positive responses to control efforts by covered fish species.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
	Effectiveness: Removal of non-native submerged and floating aquatic vegetation	Localized density of non-native predatory fish: large mouth bass and others as necessary (fish/m^3).	Reduce localized abundance of non-native predatory fish species by ___% from 1 week prior before to 90 days after treatment/removal relative to a nearby control location.	1 week before treatment/ removal to 90 days after treatment/removal	Catch fish using electrofishing, pop nets, or other unbiased sampling technique for collecting fish in vegetation 1 week prior to and 90 days after removal of Egeria in areas both within and nearby removal locations	Establish a relationship between local density of non-native predatory fish and SAV/FAV density	If there is no negative relationship between removal and localized density of non-native predatory fish, consider discontinuing action if there are no positive responses to control efforts by covered fish species.
OSCM14: Increase the Harvest of Non-Native Predatory Fish to Decrease their Abundance.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM15: Reduce Mortality of Released Salvaged Fish by Non-Native Predators.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM16: Reduce Illegal Harvest of Chinook Salmon, Central Valley Steelhead, Green Sturgeon, and White Sturgeon in the Delta.	**Effectiveness:** Add up to 17 additional wardens to the Delta-Bay Enhanced Enforcement Program (DBEEP)	Citations per public contact	Average number of citations per public contact will asymptote and decline.	Yearly	Recording number of contacts and citations	Citations per public contact as a function of	No more wardens would be hired at the time, although, if the number of citations begins to increase in the future, additional hiring would be considered (up to 17 wardens). If citations become very low, the BDCP Implementing Entity could consider terminating funding for some positions
OSCM17: Reduce Adverse Effects of Harvest on Sacramento Splittail Abundance.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM18: Develop and Implement Hatchery and Genetic Management Plans to Minimize the Potential for Genetic and Ecological Impacts of Hatchery Reared Salmonids on Wild Salmonid Stocks.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM19: Reduce Losses of Wild Stocks of Chinook Salmon to Commercial Fishing and Recreational Fishing through a Mark-Select Fishery.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM20: Establish New and Expand Existing Conservation Propagation Programs for Delta and Longfin Smelt.	To come.	To come.	To come.	To come.	To come.	To come.	To come.

Conservation Measure	Monitoring Type/Hypothesis	Metric	Adaptive Management Target and Triggers	Monitoring Schedule	Monitoring Method	Relationships	Potential Adaptive Management Responses
OSCM21: Screen, Remove, Relocate, Consolidate, Modify and/or Alter Timing of Non-Project Diversions to Reduce Entrainment of Covered Fish Species at within the Delta.	To come.	To come.	To come.	To come.	To come.	To come.	To come.
OSCM22: establish no wake boating zones in delta waterways toprotect sensitive covered species shoreline habitat.	To come.	To come.	To come.	To come.	To come.	To come.	To come.